2

SITE PLANNING

This chapter includes design standards and procedures that guide the creation of a site plan, preliminary plat or other similar types of plans. It references architectural and streetscape guidelines that relate to achieving the preferred character for development in Scottsdale. This chapter also provides specific guidance for preparing site plans and related designs within areas designated by the Environmentally Sensitive Lands Ordinance (ESLO).

contents

One Stop Shop
7447 E Indian School Road
Suite 100
480-312-2500

Planning, Environment & Design
7506 E Indian School Road
480-312- 7990

Current Planning
7447 E Indian School Road
Suite 105
480-312-7000

Plan Review
7447 E Indian School Road
Suite 105
480-312-7080

www.ScottsdaleAZ.gov/Design/DSPM

site planning

GENERAL CONSIDERATIONS

2-1

This section provides general guidance for most projects and conditions in the city, including design guidelines for specific areas and uses, site context considerations, on-site circulation and parking, fire lane dimensions, drainage facilities, landscape design and outdoor lighting. These guidelines supplement ordinance provisions and provide basic approaches and standards preferred in the city of Scottsdale.

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GENERAL CONSIDERATIONS

2-1

MASTER ENVIRONMENTAL DESIGN CONCEPTS & PLANS

2-1.100

Most master planned developments since the early 1980s have been required to prepare master environmental design concepts and plans (often referred to as MEDCAPs). These cover a wide range of design guidelines and plans, from trails and paths to landscaping architectural themes and common amenities and facilities. All development applicants should determine if a MEDCAP applies to their site and should use the guidelines contained therein in addition to those contained in this document.

DESIGN GUIDELINES FOR SPECIFIC AREAS

2-1.200

For Environmentally Sensitive Lands design guidelines, see Section 2-2.

CORRIDORS & STREETSCAPES

2-1.201

Scottsdale has developed specific design guidelines for the dimensions, use and design elements of a number of natural open space and streetscape corridors. These are in addition to the criteria contained herein and may in some cases supercede similar criteria from other sections. Refer to www.scottsdaleaz.gov/design/corridorplans/.

A. Open Space Corridors

There are three main categories of open space corridors for which guidelines have been developed: scenic corridors, buffered setbacks and vista corridors. The locations are identified in the General Plan and/or have been required as a part of zoning stipulations.

1. **Scenic Corridors:** These are corridors along selected major streets where there is a desire by the community to retain views of nearby terrain features and retain the character of the natural desert setting.
   - Carefree Highway - Scottsdale Road to the city's western Boundary – 2 miles.
   - Cave Creek Road - Pima Road to the city's northeast boundary -- 3.5 miles.
   - Dynamite Boulevard - 56th Street to the city's eastern boundary -- 10.5 miles.
   - Pima Road - North of the Loop 101 to Cave Creek Road -- 11 miles.
   - Scottsdale Road - North from Frank Lloyd Wright to Carefree Highway – 11 miles.
   - Shea Boulevard - Pima Freeway to the city's eastern boundary – 9 miles.
2. **Buffered Setbacks:** These are corridors along significant streets where there is intent by the community to achieve a boulevard type of effect, recognizing the importance of the roadway in the local setting.
3. **Vista Corridors:** These are corridors along major washes and channels that are intended to provide local and community vistas of nearby terrain and the desert setting as well as provide access corridors to neighborhoods, parks and schools.

B. Streetscapes

Specific design guidelines have been developed for a number of major streets. These generally focus on the design of landscaping and street furniture along the edges and medians of these streets.

Frank Lloyd Wright Boulevard	McDowell Road	Via Linda
Shea Boulevard	Scottsdale Road	Cactus Corridor

2-1.202 DOWNTOWN DESIGN GUIDELINES

Specific guidelines for buildings and streetscapes have been developed for the downtown area. Any development in this area should use these guidelines in addition to the other guidelines contained herein. Refer to Appendix 8-1A for recommended plants downtown or go to www.scottsdaleaz.gov/projects/downtown.

2-1.203 AIRPORT & AIRPARK DEVELOPMENT GUIDELINES

For information on development within the airpark and airport, including object height, noise attenuation, avigation easements, and taxilane restrictions, refer to www.scottsdaleaz.gov/airport/regulatorydocs.asp for the Scottsdale Airport-Vicinity & Airpark Development Guidelines.

2-1.300 DESIGN GUIDELINES FOR SPECIFIC USES

Scottsdale has developed architectural and site planning guidelines for specific types of land uses, including: offices, gas stations and convenience stores, restaurants, parking structures and commercial uses. These contain details and standards that apply to the specific use that are in addition to the other standards contained in the Zoning Ordinance, area plans and this manual. Refer to www.scottsdaleaz.gov/design/archeng/.

1. **Design Guidelines for Office Development:** This set of guidelines includes site planning and design, architecture, landscape design, lighting and identification/signage with a focus on office industrial, office warehouse, office aircraft hanger and general office projects. They address the context of a site, responding to the natural setting and climate of the desert Southwest and achieving quality design.
2. **Design Guidelines for Gas Station and Convenience Store Development:** This set of guidelines includes site design, architecture, pump islands, landscape, lighting and signage/corporate identification. Special focus is made on canopies over pump islands and lighting approaches for such high activity areas.
3. **Design Guidelines for Restaurant Development:** This set of guidelines includes site design, architecture, landscape design, lighting and signage/corporate identification. Special emphasis is placed on relating to the local context, outdoor dining areas and sensitivity to residential neighborhoods.
4. **Design Guidelines for Parking Structure Development** (under development)
5. **Design Guidelines for Commercial Development:** These guidelines include site design, architecture, landscaping, lighting and signage/corporate identification. Emphasis is placed on relating to the local context, parking areas, pedestrian access and design appropriate to the setting and climate of the desert Southwest.

Refer to the **Scottsdale Sensitive Design Principles** as a guide for the preparation of development proposals, available online at http://www.scottsdaleaz.gov/design/general/.

SITE CONTEXT

2-1.400

The following guidelines focus on the relationship of a proposed site plan to the natural terrain of the property as well as the relationships this proposal will have with existing or planned uses adjacent to it. The goal is to fit development into the natural site with minimal intrusion and to be sensitive to adjacent uses.

TERRAIN

2-1.401

1. Site features such as washes or native desert vegetation should be kept in as natural state as possible.
2. Washes should be used as amenities for the site; common recreational, patio, outdoor dining and other such facilities should be oriented toward such natural features.
3. Major desert vegetation specimens should be kept in place wherever they are located particularly if they are located in required setbacks, parking landscape islands or other such open space areas.
4. On sites where there is significant change in the grade levels from the site to adjacent properties, the site design should accommodate the grading transition through design techniques such as landscaped terraces, landscaped slopes of 4:1 or gentler or some similar gradual technique.
5. Retaining walls of over 2 feet in height shall not be placed at the property line.
6. When the site has a non-residential use and the adjacent site is a residential use, required screening walls should either be placed along the edge of the parking/driveway areas if the developing site is higher than the adjacent site or at the property line if the site is lower.

BUFFERING FOR ADJACENT LAND USES

2-1.402

1. Site plans for non-residential uses that are next to residential uses or for multi-family uses next to single-family uses should incorporate the following buffering techniques:
   a. Locate refuse containers either internally to the site or at least oriented toward the interior of the site.
   b. Locate loading areas either away from the perimeter of the site or screened from the perimeter by a solid wall tall enough to shield the unloading operations and vehicles from off-site views.
   c. Use landscaped open spaces to screen on-site buildings and activities.
   d. Locate out-door dining areas and patios where the on-site buildings screen them from views off of the adjacent properties or where they are sufficiently screened by walls, landscaping and significant distance so that they have no discernable impact on adjacent properties.
2. Install landscaping that is used for buffering between different land uses that is substantial enough in size and density to achieve the desired buffering effect as soon as possible. This landscaping should:
   a. Use 2 inch minimum caliper or larger tree materials,
   b. Space trees at a rate of one every 20 to 30 feet apart (based upon the type of canopy the tree creates) if the landscaped areas is less than 10 feet wide or one for every 300 to 400 square feet for larger landscaped areas,
   c. Not use mounding unless the mound is at least 40 feet away from the perimeter of the property, and
   d. Not include landscape lighting that illuminates the tree canopies

2-1.500 ON-SITE CIRCULATION & PARKING AREA DESIGN

The following guidelines focus on general and specific techniques to assure safe access, emergency access, and community benefits.

2-1.501 MAJOR DRIVEWAYS

Major driveways feed traffic into a parking lot with over 50 spaces from the street and/or provide the driveway access across the front of a retail center. Such driveways should:

1. Be a minimum width of 30 feet from face-of-curb to face-of-curb,
2. Not include designated customer loading areas for the landscaping, construction materials, appliances, etc. departments of retail stores and loading areas used for general business activity,
3. Provide adequate stacking depths where they access public streets and do not allow direct parking aisle access in close proximity toe the street intersection, and
4. Provide adequate turn-around space for fire equipment vehicles if there is a dead-end driveway that is 150 feet or longer.

2-1.502 FIRE LANES AND EMERGENCY ACCESS

For specific Fire Department requirements, including a Fire Plan Review checklist, refer to www.scottsdaleaz.gov/bldgresources/SubmittalGuidelines/.

After reviewing the plan for the proposed development, the Fire Department may require that fire lanes be provided around structures for fire fighting access. If fire lanes are needed, the following criteria for the lanes shall apply:

1. The minimum width of a fire lane is 24 feet. (See International Fire Code Sections 503.2.1 and 503.2.2 for other lane width requirements.)
2. The fire lane surface shall be suitable for all-weather use, with a minimum loading design of 83,000 lb. gross vehicle weight. Where not co-located with vehicular service or access lanes, surfaces other than asphalt such as concrete, paver stones, “grasscrete” and stabilized and compacted crushed granite should be considered.
3. The minimum vertical clearance for the passage of fire department apparatus is 13 feet 6 inches.
4. The minimum outside edge radius of the lane on a turn is 45 feet for commercial and multi-family uses and 40.5 feet for other residential uses (see Figure 2.1-1 below).

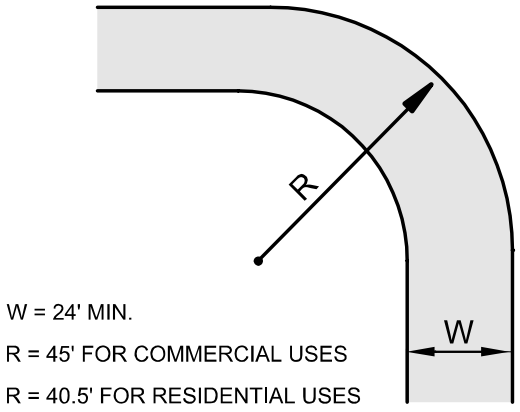
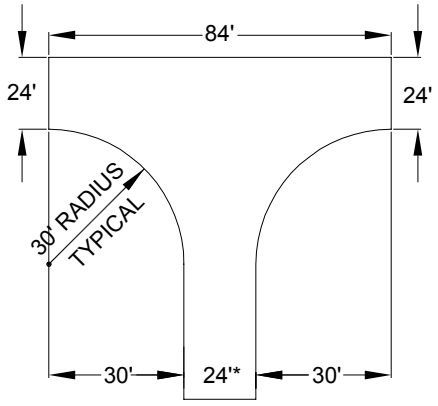


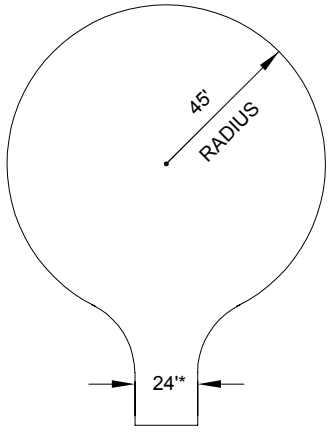
FIGURE 2.1-1. FIRE LANE DIMENSIONS

5. The fire lanes must be posted in accordance with the COS Standard Detail 2365.
6. See Figure 2.1-2 for on-site fire access turnarounds for commercial and residential developments.
7. Provide a turn-around for emergency vehicles at the end of a dead-end parking aisle if it exceeds 150 feet in length, as shown by the T-Types in Figure 2.1-2 below.

COMMERCIAL

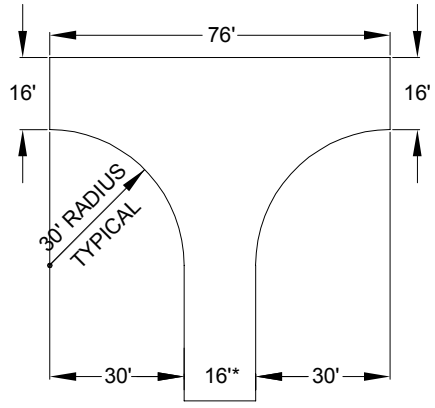


T-Type

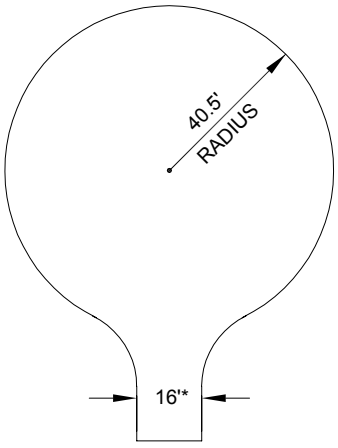


Cul-de-Sac

RESIDENTIAL



T-Type



Cul-de-Sac

* Dimension to back of curb for roll or ribbon curb and to face of curb for vertical curb.

FIGURE 2.1-2. ON-SITE FIRE ACCESS TURNAROUNDS

A. Emergency Access Provisions

After reviewing the plan for a proposed development, the Fire Department may require that an access be provided for fire fighting and emergency vehicle use in addition to the planned public access ways. If such an emergency access route is intended to be closed and locked, any lock placed on an emergency access gate must be approved by the Fire Department. If a development is planned with only one public access point, the Fire Department will normally require an emergency access to insure that an emergency vehicle can reach the interior of the development when the normal access is blocked. Emergency access ways shall be secured by an easement. COS Standard Detail 2364 describes the construction and identification of emergency access ways.

2-1.503 DRIVE-THROUGH FACILITIES

Where allowed, locate and design drive-through facilities according to the following criteria:

1. Unless there is no reasonable alternative, locate drive-through facilities on rear of a building facing away from the nearby street frontage(s) or on the sides of the building. Drive-through facilities should not be located near any residential uses. Vehicular storage areas for drive-through facilities placed on the street side of a building or any other location which is directly visible from adjacent properties should be screened by walls, mounding and or dense landscaping at least 4 feet in height.
2. Provide stacking distance for at least 6 vehicles (minimum of 140 feet) for each lane leading into a drive-through facility.
3. Outdoor speakers at drive-through facilities should not be audible across the property line of the building site. Outdoor speakers should not be placed within 300 feet of a property used for residential purposes.

2-1.504 REFUSE COLLECTION

Locate and design Refuse collection facilities based upon the following criteria:

1. Do not place trash enclosures between the on-site buildings and adjacent lower density residential uses unless there is no reasonable alternative. If this is done, orient the enclosure toward the interior of the property.
2. Place trash compactors, if located within 1,300 feet of a residential use, within a fully enclosed area with walls that are at least 2 feet higher than the compactor equipment.
3. Do not place trash enclosures next to drainage ways or basins, wherever possible.
4. Trash enclosures shall follow the specifications in MAG Detail #2146-1.
5. The walls of a trash enclosure shall have the same treatment on the inside surfaces as is used on the exterior surfaces. The color, material and texture of the surfaces should match those of the main buildings on the site.
6. Gates across the front of a trash enclosure are generally discouraged. If desired, a trash enclosure with gates shall be designed to accommodate full ADA access.
7. Do not place a refuse enclosure at the end of a dead-end parking aisle.

2-1.505 MULTI-FAMILY GARAGES

In R-4, R-4R, R-3, R-5 and S-R zoning districts where multi-family uses propose to have garages, the face of the garage door shall be set back from the curb, sidewalk or edge of the through travel lane either 3 to 6 feet or at least 18 feet (20 feet is preferred).

Guest parking spaces shall be provided and shall be clearly shown on the site plan as well as clearly marked on the site.

LANDSCAPING AND PAVEMENT TREATMENTS 2-1.506

Incorporate elements in the design of parking areas that give the parking facility clarity of form and provide amenity to its users. Among the elements that should be included are:

1. Planters within a parking area that are at least 7 feet across as measured from the back of curbing,
2. Trees that are heat tolerant, have minimal dropping of pods and sap and have canopies that can have a canopy bottom at least 10 feet above the ground,
3. Concrete or paver materials that delineate pedestrian access routes across parking areas and across major on-site driveways leading up to main entrances, and
4. Separated pedestrian walkways that connect the distant parts of the parking area with the front doors of the businesses.

PEDESTRIAN AND BICYCLE FACILITIES 2-1.507

A. Pedestrian Facilities

1. Walkways that connect main on-site buildings entrances to the sidewalks on adjacent streets shall have a minimum width of at least 6 feet wide excluding any parking over-hangs or other obstructions and should be the same width as the sidewalk along the street if it is wider than 6 feet. Such connections should be continuous and clearly recognized by both pedestrians and drivers.
2. Provide shade wherever possible for on-site walkways either through the use of tree canopies or structural canopies.
3. The minimum unobstructed width of walkways placed across the front of retail centers or mixed use buildings should be 12 feet.

B. Bicycle Facilities

1. Place bicycle parking facilities for public guests of a building near the main entrance to the building in a visible location. Do not place these in a manner that interferes with pedestrian access into the building.
2. Place bicycle parking facilities for employees near employee entrances. They should be well lit and should not interfere with access to the employee entrance. Provide shade wherever possible.

DEAD-END PARKING AISLES 2-1.508

1. Provide a 5-foot deep back-up area at the end of any dead-end parking aisles and a 5-foot curb radii leading into this pavement extension.
2. Provide 10 feet wide parking spaces at the end of a dead-end parking aisle.
3. Do not build a dead-end parking aisle that is more than 150 feet long.

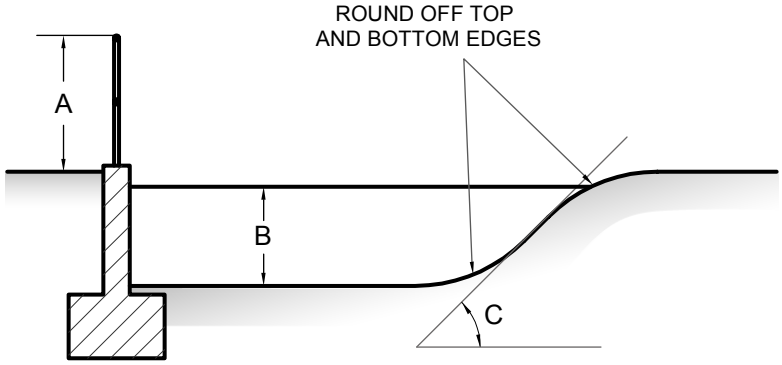
DRAINAGE FACILITIES 2-1.600

DETENTION BASINS 2-1.601

Incorporate the following criteria in the design of drainage detention basins:

1. The maximum depth of water stored in the basin should be 3 feet (see Figure 2.1-3).
2. The maximum side slope of the basin is 4:1 unless otherwise approved by city staff.
3. Round and contour the bottom and top edges of the side slopes in order to achieve a gradual slope transition.

4. Use textured and/or dark surface treatments on the portion of the wall that could be inundated to minimize the visibility of staining typical to basins where retaining walls are used as an edge of a basin. Place safety railings or solid walls at least 42 inches tall on top of such walls.
5. Use only plant materials in basins that are capable of being inundated and surviving. Trees and woody shrubs are preferred; avoid succulents and herbaceous shrubs in basins. In areas where natural desert plants are being used, use those plants that are typical to desert riparian areas (e.g. mesquite, blue Palo verde, desert willow, wolfberry, desert hackberry, desert holly, jojoba, beloperone, etc.).
6. Basins should not occupy more than 50% of the frontage landscaped area.
7. Do not place drainage basins on individual lots unless the following criteria are met:
   a. The basin is directly accessible and visible from a street or alley.
   b. The maintenance of the basin is designated to a property owners association.
   c. The basin and its access are placed within a drainage and access easement.



A: 42" MIN. B: 36" MAX. C: 3:1 MAX. / 4:1 AVERAGE

FIGURE 2.1-3. DETENTION BASINS

2-1.602 SURFACE CHANNELS

Site plans should incorporate the following criteria in the placement, design and use of surface drainage facilities:

1. Keep major natural vegetation specimens along washes in place wherever possible.
2. Place amenities for the on-site use, such as dining patios or recreation centers, next to drainage ways where feasible.
3. Landscape any engineered and constructed channels in a manner that helps to manage the storm flows and provides the channel as a visual amenity for the site and community. Concrete and rock surfaces should be kept to a minimum. If such materials are used, they should be formed and applied in a “natural” manner or designed to integrate with the on-site buildings.
4. Provide walkways and/or trails on large sites of 20 acres or more next to or within such drainage ways.
5. Any rock used in any drainage facility shall be native and/or crushed rock. Do not use river-run cobbles.

LANDSCAPE DESIGN

2-1.700

DESIGN STANDARDS

2-1.701

1. Use a palette of plants in a landscape design that adhere to the Arizona Department of Water Resources (ADWR) Low Water Use/Drought Tolerant plant list.
2. Any landscape design in Scottsdale shall comply with the provisions of the city's Water Conservation ordinance (Chapter 49; Article VII). In particular, landscaping plans shall follow the specific limitations regarding the use, design, location and installation of fountains, turf and water intensive landscaping.
3. There shall be no more than seven feet of open ground area between mature plant canopies in landscaped areas, excluding areas of turf or hardscaped surfaces. The mature canopy of a plant shall be that which the plant would achieve 7 years after its installation in the landscaping.
4. Incorporate salvaged native plants from the site into the landscape design for the property. Their placement shall consider the natural culture for that type of plant.
5. The maximum height of any shrubs, ornamental plants, boulders, walls or other such materials within a designated Sight Visibility Triangle shall be 2 feet. For plants, this shall be the nature height of the plant. Any trees that are to be placed in the Sight Visibility Triangle shall have a canopy that is kept above 7 feet above the curb height and a maximum mature trunk diameter of 8 inches (see Figure 2.1-4).
6. Do not place trees and boulders within a Public Utility Easement (PUE), Emergency Vehicle Access Easement or their equivalent.
7. Place trees, saguaros or in-line walls at least 7 feet back from any underground public water or sewer lines or power line conduit (see Figure 2.1-5).

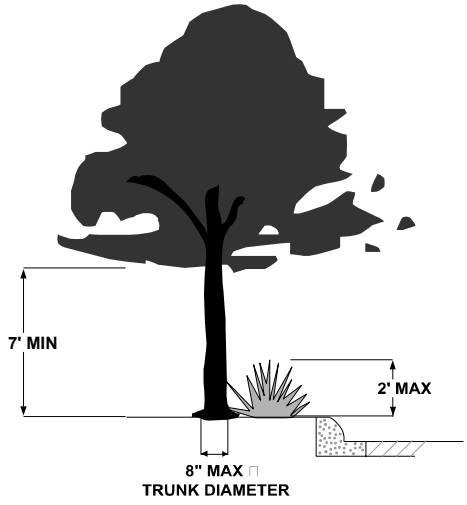


FIGURE 2.1-4. LANDSCAPING IN THE SIGHT DISTANCE TRIANGLE

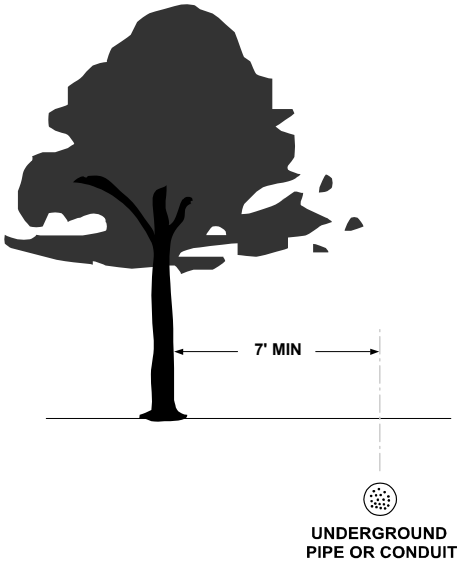


FIGURE 2.1-5. TREE SETBACK FROM UNDERGROUND PIPE OR CONDUIT

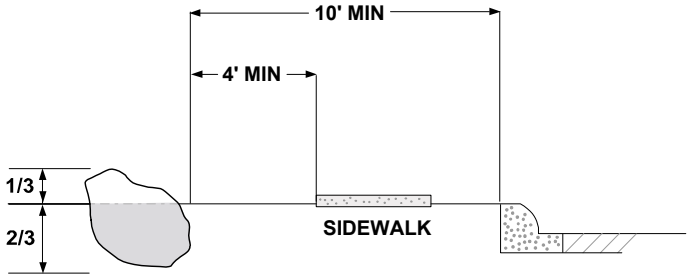


FIGURE 2.1-6. BOULDER PLACEMENT

8. Install any boulders with 2/3 of their volume below the ground and place them at least 10 feet away from any curb and at least 4 feet from any walkway (see Figure 2.1-6).
9. Install decomposed granite, if used as a ground cover, to a minimum depth of 2 inches on sites outside of ESLO areas.
10. Use indigenous rock for any rip rap applications (river run rock is not allowed).
11. Place trees so that their mature canopies shall not overhang the vehicular lanes in a street or across property lines. Place them so as to not block monument or tower signs.
12. Do not plant thorny shrubs and cacti where their mature canopy would be closer than 4 feet from any walkways or parking area curbing.
13. Build perimeter and site walls with either 6 or 8 inch wide concrete masonry blocks, 8 inches wide brick, stone, concrete or a similar solid and durable material. Stucco and paint the surface of concrete block walls to match the on-site buildings unless they are split-faced, grid or similar decorative types of block. Locate grade breaks of the top of the wall at piers or corners wherever possible. Include varied setbacks, alignments and or heights and/or piers or buttresses for walls over 200 feet long the horizontal and vertical alignment of the wall in order to provide visual interest.
14. Do not plant shrubs and trees within the 2 feet overhang at the head of a parking stall.
15. Provide base planting landscaping areas adjacent to the building on all sides of buildings in a suburban or rural type of context, except where there are designated loading areas. The minimum of any such area shall be 8 feet excluding any pedestrian walkways. Include trees and shrubs in these areas that provide strategic shading of the windows and doors, reinforce the architectural elements of the building and provide comfort and interest to pedestrians.

2-1.702 IRRIGATION

1. Provide an automatic irrigation system for all landscaped areas. This system shall include a back flow preventor and be designed to minimize overflow and seepage outside of the landscaped area.
2. Completely screen backflow preventors using a screening wall, cage, or dense evergreen plant materials. Place them next to the water meter. All back flow preventors shall be designed and installed per the COS/MAG details.
3. Do not connect water features to the irrigation system. Provide a backflow preventor per the same details as noted above.
4. Set back all spray or stream types of irrigation heads at least 1 foot from a curb or sidewalk. The Zoning Administrator or designee may approve alternative designs that control overspray.

LIGHTING 2-1.703

Any landscape lighting shall be subdued, preferably of low voltage and shall not illuminate building walls. Bury or otherwise hide from public views the control boxes, wiring and mounting hardware for landscape lighting.

GRADING AND DRAINAGE 2-1.704

1. Grade the land adjacent to walk ways or curbs so that it falls away from the walk or curb at a slope of at least 8% but not more than 25% for a distance of at least 10 feet.
2. The maximum ratio between the width to depth of a retention basin shall be 10:1, unless otherwise approved by the Zoning Administrator or designee.
3. The maximum slope for a landscaped bank on the edge of a detention basin shall be 4:1. Walled banks may be permitted subject to the wall design meeting the usual structural and safety standards of the Building Code and as approved by the Development Review Board.

GENERAL DESIGN STANDARDS 2-1.705

1. Do not use exterior downspouts. Use interior roof drainage wherever possible. If there is no reasonable alternative, downspouts may be used if they are firmly secured to the building, are not located along a driveway and are integrally designed into the materials and character of the building.
2. Design and construct receiving areas on the ground for rooftop drainage in a manner that minimizes erosion, staining of nearby building walls and directs water away from the building foundations.
3. Use a tapered, conical one-piece form for all flagpoles.
4. Integrate rooftop mechanical screens with the building materials, colors and character.

OUTDOOR LIGHTING 2-1.800

AMBIENT LIGHTING ZONES 2-1.801

In its most recent update of lighting standards and design approaches, the International Illumination Society (IES) developed a concept of Ambient Lighting Zones as a basis to provided appropriate lighting levels based upon the overall context of an area. This recognizes that urban areas with a great deal of pedestrian activity need different lighting levels than areas of very large lots and passive expanses of open space. Figure 2.1-7 represents where such ambient lighting zones apply to the Scottsdale. The design of outdoor lighting should use these lighting zones in conjunction with the most recent IES lighting design manuals. Refer to www.scottsdaleaz.gov/design/Lighting.

E-1 – Intrinsically Dark Areas: These are predominantly passive open space areas or very low density residential neighborhoods (3 acre or larger lots). There is little nighttime activity and few outdoor lighting sources.

E-2 – Estate/Rural Areas: These are low-density areas (typically ½ to 2 acre lots) or there are substantial areas of passive open space interlaced within the pattern of development. Pedestrian activity is minimal but there are occasional retail/service and community service facilities that have nominal amounts of local activity. Lighting levels are generally low; there is often an expectation in the neighborhoods that the lighting levels remain low.

E-3 – Suburban Areas: These are the typical suburban areas that have moderate to higher residential densities along with a mix of campus or open style retail, service, employment and public facilities. Lighting levels in general are moderate, although in some areas such as those around retail centers or schools the need for higher lighting levels may exist.

E-4 – Urban/Pedestrian Activity Areas: In these areas there are typically dense land uses, often with little setback from the streets, and there is a rich mix of different uses. Retail and cultural uses tend to generate higher levels of pedestrian activity, resulting in the need for higher levels of lighting.

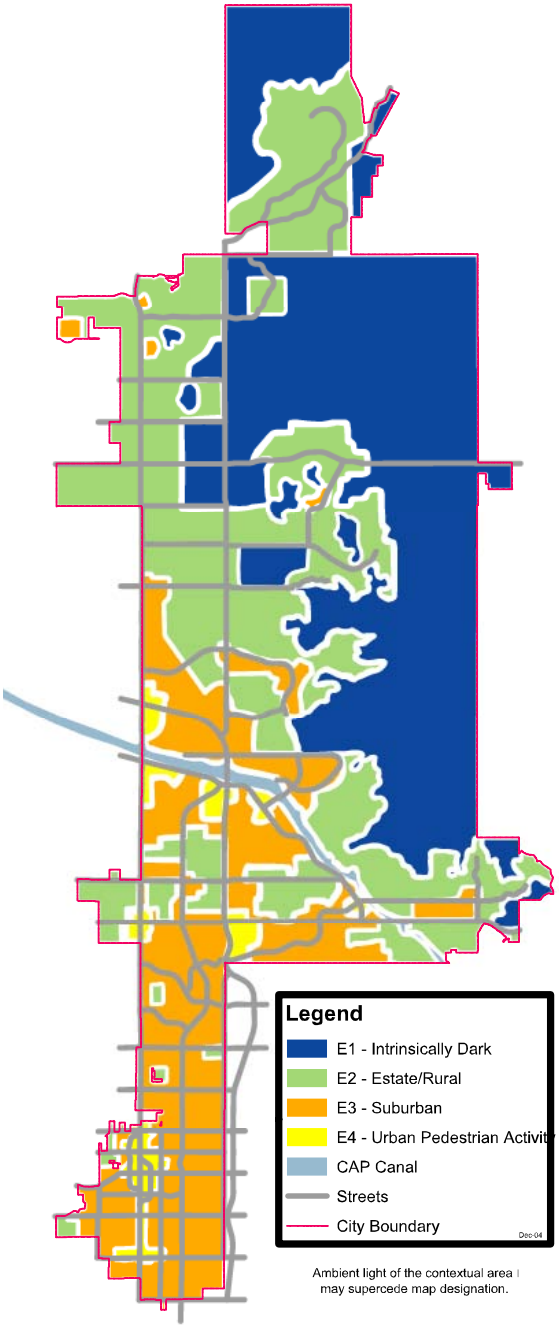


FIGURE 2.1-7. AMBIENT LIGHTING ZONES

Use these general lighting design principles for outdoor lighting:

5. Consider and reflect the nature of the adjacent land uses in all lighting designs. In particular, maintain the existing ambient lighting level of adjacent residential areas.
6. Focus outdoor lighting on identified tasks instead of providing a wash of lighting across a site or building. Emphasize lighting for pedestrian access and activity areas such as building entrances, walkways and outdoor gathering facilities.
7. Provide gradual transitions from well lit to unlit areas.
8. Special uses, such as sports facilities or outdoor displays, will require specific lighting approaches.
9. In general, the lighting source should not be visible from off of the property.

STREET LIGHTING 2-1.802

Street lighting design in the city of Scottsdale should follow the latest edition of the IES "Roadway Lighting" manual (RP-8). Figure 2.1-8 identifies four different lighting level areas within the city that are to be used as a basis of design approach. The four street lighting approaches are:

No Street Lights – In this area there are large expanses of open spaces or low residential densities with few other uses that would generate any pedestrian activity. Streetlights will be provided at signalized intersections.

Partial Lighting – This area includes those with significant natural areas and land slopes of 3% or greater and those with one acre parcels that are pocketed into suburban areas. Where the residential density is less than 1.5 dwellings per acre, streetlights will be placed at intersections along collector or larger streets. Where the densities are higher, streetlights will be placed at all street intersections. (Refer to RP-8 Section 3:13.)

Suburban Street Lighting - These are the typical medium density residential, commercial and employment areas. For residential areas the maintained illuminance values should be based upon RP-8 Table 2.b column R4. For the Airpark and other business areas the same column should be used with the "Intermediate" land use area classification.

Pedestrian Activity Lighting – These areas are those where there are relatively high-density land uses, higher levels of transit service, and a mix of uses that generate strong pedestrian activity. The maintained illuminance values for such areas should be based upon RP-8 Table 2.b column R4 and using the "Commercial" land use area classification.

Consider these general design principles in the design of street lighting:

1. Where street lighting levels change along a street corridor, the design should consider RP-8 Section 3:16, "Transition Lighting."
2. Light walkways and separated bikeways using the maintained illuminance levels identified in RP-8 Table 4.

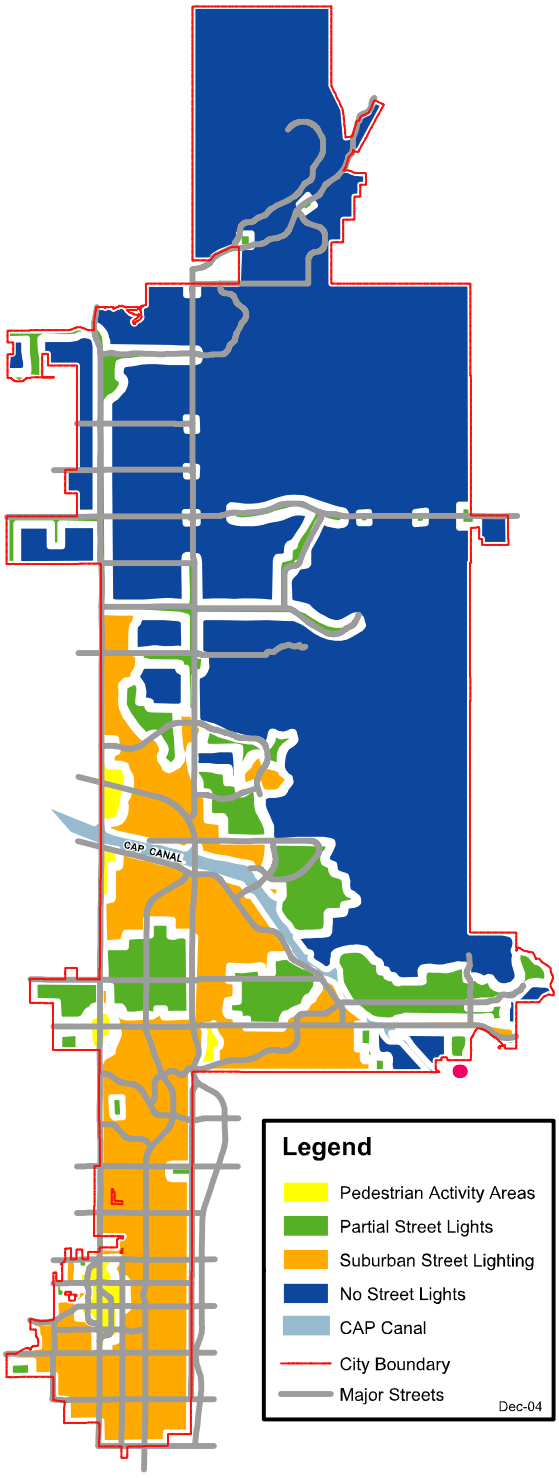


FIGURE 2.1-8. STREETLIGHT POLICY MAP

site planning

ENVIRONMENTALLY SENSITIVE LANDS

2-2

This section specifies site design considerations, standards, and criteria for the area covered by the Environmentally Sensitive Lands Ordinance (ESLO). It addresses utility location, drainage planning, roadway improvements and site work for protecting the unique topography, vegetation and geology within the ESL area.

One Stop Shop
7447 E Indian School Road
Suite 100
480-312-2500

Planning, Environment & Design
7506 E Indian School Road
480-312- 7990

Current Planning
7447 E Indian School Road
Suite 105
480-312-7000

Plan Review
7447 E Indian School Road
Suite 105
480-312-7080

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ENVIRONMENTALLY SENSITIVE LANDS

GENERAL INFORMATION

For more information and related resources, refer to www.scottsdaleaz.gov/codes/eslo.

A. History/Background

The **Environmentally Sensitive Lands Ordinance** (ESLO) is a set of zoning regulations adopted by the City Council in 1991 (amended in 2001, 2003 and 2004) to guide development throughout the 134 square miles of desert and mountain areas of northern Scottsdale. These areas are generally located north and east of the Central Arizona Project canal (see Figure 2.2-1).

To verify if a parcel is located in the ESL overlay area, and to confirm the landform category, refer to the Digital Map Center at http://eservices.scottsdaleas.gov/dmc.

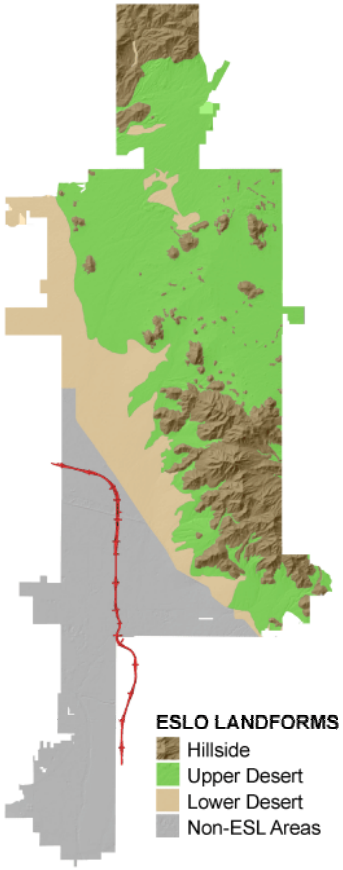


FIGURE 2.2-1. ESLO AREA / LANDFORMS MAP

B. Purpose

The intent and purpose of ESLO is to identify and protect environmentally sensitive lands in the city and to promote public health and safety by controlling development on these lands. The ordinance requires that a percentage of each property be permanently preserved as Natural Area Open Space and that specific environmental features be protected, including vegetation, washes, mountain ridges and peaks, to assure appropriate development.

C. Goals

The Environmentally Sensitive Lands Ordinance has been established in order to:

1. Encourage the protection of unique and sensitive natural features in the Upper Sonoran Desert, including but not limited to the mountains and hills, large rock formations, native landscape, archeological and historical sites and significant washes,
2. Encourage development that blends with the character and nature of this special desert setting,
3. Protect the public and property from the special hazards that can be found in this desert setting, and
4. Minimize the costs to build and maintain the public infrastructure needed to sustain the use of the land.

This ordinance is not intended to deny the reasonable use of the land, but to guide its use in ways that are sustainable and recognize the unique opportunities this setting provides.

D. Community Benefit

ESLO has a direct impact on the residents of Scottsdale by determining the location and design of residential, commercial, industrial and institutional development in almost two-thirds of the city. Application of ESLO, and its predecessor the Hillside Ordinance, has resulted in the preservation of over 9,000 acres of Sonoran Desert open space while protecting our residents from potential flooding, erosion and detrimental visual impacts.

2-2.100 UTILITIES

In general, locate and design utility facilities and corridors in a manner that minimizes any degradation to the key natural desert features that are being conserved by ESLO. This section provides guidelines that support the goals of ESLO while also allowing for the reasonable and necessary installation of infrastructure serving the land uses in the area. See Chapters 6 and 7 for specific guidelines for water distribution and wastewater collection lines.

Use the following general principles in the design and construction of utility facilities in ESL areas:

1. The installation of utility corridors shall not result in slope movement or surface subsidence.
2. Prevent increased erosion along utility corridors.
3. Utility crossings shall not obstruct or constrict washes.
4. Replace vegetation removed for utility construction or maintenance with appropriate native desert plants.
5. Do not place utility corridors requiring frequent maintenance through significant riparian, vista, or habitat corridors.
6. All utility facilities are to be placed under ground or screened from public view.

WATER DISTRIBUTION LINES 2-2.101

A. Location

To minimize their impact in ESL areas, locate all public water distribution lines within private and public street rights-of-way. Location of water system lines in other areas shall require the approval of the Water Resources Department. Water lines that must be located outside of public rights-of-way will require a waterline easement, and placement within a tract, where applicable.

Place water lines within the pavement section of street rights-of-way and locate water meters adjacent to driveways to reduce impact on sensitive ESL landforms.

B. Easements

The minimum width of easements within tracts where the lots are less than 22,000 square feet in size shall be 20 feet wide. Place the entire easement on one side of a property line.

All walls crossing easements must be constructed of wood, wire, or removable type fencing. Re-vegetation or landscaping within the easement must not restrict access.

C. Crossings of Drainage Ways

Water lines should not cross drainage ways unless the crossing is associated with a roadway or driveway. Where crossings are required, locate the water line as close to perpendicular to the flow path of the wash as possible.

D. Water Storage Facilities

1. Locate water storage facilities, such as water tanks and reservoirs, underground and/or in such a way to reduce impacts to the surrounding environment.
2. Paint any above grade tank surface a color to match surrounding native stone, rock or soil color.
3. Tanks are prohibited on slopes greater than 3:1 unless approved by the Planning and Development Services and Water Resources General Managers, or their designees.

WASTEWATER COLLECTION LINES 2-2.102

A. Location

Locate, all public sewer collection lines, including public sewer force mains, within private and public street rights-of-ways to minimize impacts on sensitive ESL areas. Place a wastewater line located outside of private or public street rights-of-way within a sewer line easement, or tract (where the lots are smaller than 22,000 square feet in area).

Sewer lines will be allowed to cross the centerline and be located within the pavement section but should not cross the curb line. Locate manholes to keep manhole covers out of the tire paths on the roadway.

B. Easements

The minimum width of easements is 20 feet. Place the entire easement on one side of a property line.

All walls crossing easements must be constructed of wood, wire, or removable type fencing. Re-vegetation or landscaping within the easement must not restrict access.

C. Drainage Ways

Do not locate wastewater lines within the area along drainage ways inundated by a 100-year storm flow, unless specifically approved by Planning and Development Services and Water Resources. Exceptions will be based upon specific design analyses that

demonstrate there will be no mixing of flows and no other viable solution is available. If located alongside a drainage way, do not clear the natural riparian vegetation that exists during construction of the wastewater line.

Do not cross drainage ways with wastewater lines unless there is no other reasonable alternative alignment. Where possible, place such crossings in association with the location of roadways or driveways and/or perpendicular to the flow path of the drainage way.

2-2.103 PUBLIC LIFT STATIONS

In ESL areas, wastewater pumping stations and pressurized collection systems may be used with approval from the Water Resources Department.

Protect wastewater pumping stations from inundation by storm water runoff. Locate such stations so that adequate access is available. Applicants are encouraged to contact the Water Resources Department prior to design of wastewater systems in ESL areas.

2-2.104 INDIVIDUAL SEWAGE EJECTOR SYSTEMS

If sewer service cannot be provided by gravity flow, install an individual ejector pump to transport wastewater from a residence. The private ejector pump shall meet all State and County Health Department and Local Building Code requirements.

The property owner shall maintain private ejector pumps. Serve no more than one property with a private ejector system and do not extend past the property line without Water Resources approval.

2-2.105 ON-SITE WASTEWATER TREATMENT

In ESL areas where connection to a public sanitary sewer collector is not available, an individual sewage disposal system will be considered. On-site wastewater disposal systems are subject to authorization by the Water Resources prior to approval from the Maricopa County Department of Environmental Services.

Locate such facilities per Maricopa County requirements. Landscape or restore all areas cleared for such facilities to a native desert condition.

2-2.106 MISCELLANEOUS UTILITIES

A. Location

Locate utility lines within private streets and public rights-of-way to minimize impact on sensitive ESL areas. Note that the paved street section is reserved for water and sewer lines, enabling utilities to be placed within the balance of the rights-of-way. Utility locations in the ESL areas will be restricted due to grading limitations.

When circumstances dictate that utility lines be placed outside of a public/private rights-of-way, establish a Public Utility Easement, or tract where the lots are less than 22,000 square feet in area, if one does not exist.

Construction of underground utilities can exert considerable adverse impact to the adjacent lands. Therefore, revegetation of all disturbed areas is required after installation and any subsequent maintenance activities.

Avoid locating utility lines in drainage ways and channels whenever possible. When such locations are necessary, the construction plans shall specify how the facility is to be protected from runoff flows.

B. Easements

Do not place Public Utility Easements along the edge of rights-of-way unless required by the specific design for installing utilities in that location. Keep the installation of utilities within the rights-of-way.

Utility easements along side or rear lot lines must be entirely within a lot (i.e. not split with part on one lot and the remaining portion on an adjacent lot), and must be at least 12 feet wide. Utility easements along the front of lots and tracts must be at least 8 feet wide.

DRAINAGE PLANNING 2-2.200

The analysis of hydrologic and hydraulic hazards within this region must consider impacts to all downstream areas. Failure to consider these impacts may result in hazardous diversions of flow, increases in peak discharge flow rates, and disruption of the transport equilibrium. Any of these phenomena could increase the flooding and erosion potential to downstream properties and create a liability.

1. Design drainage facilities to maintain the natural runoff and channel characteristics,
2. Development must be very careful to not adversely impact drainage patterns, including the location and configuration of watershed boundaries,
3. Maintain the stability of natural drainage channels, particularly the channel banks, as much as is possible,
4. Do not increase the natural volume of existing channel flows must,
5. Maintain the natural sedimentation characteristics of an existing drainage way,
6. Do not restrict or obstruct natural habitat conditions or movements with improvements to existing channels,
7. Maintain the natural vegetation density and diversity of existing channels,
8. Preserve the viewshed characteristics of large washes and vista corridors,
9. Design detention basins to blend into the natural contours and undulations of the site and the local natural terrain, and
10. Locate detention basins within a subdivision in separate tracts, not on individual lots. Exceptions may be made by the Zoning Administrator or designee upon finding:
    a. That the basins will be maintained by a property owners association or its equivalent,
    b. That appropriately sized drainage and maintenance access easements are being provided, and
    c. That the basin is accessible from a street.

IMPROVEMENTS TO NATURAL WASHES 2-2.201

Design any improvements to natural washes done in a manner that will compliment the natural function and appearance of the site. It is preferable to leave the washes in an undisturbed state and use sufficient building setbacks to preclude the need for artificial bank protection.

Avoid any disruption of the natural geometry and bed-profile of washes in this region to the greatest extent feasible. This includes any unnatural diversion of water into or from these washes. Such diversion could upset the system equilibrium and induce accelerated bank erosion and long-term degradation of the channel bed.

A. Incised Natural Washes

Virtually all washes in the Hillside landform and many of the washes in the Upper Desert landform are well incised into the terrain. As such, they generally have capacity equal to or exceeding that necessary to contain the projected storm flows.

The steep slopes in the Hillside landform and the relatively steep slopes in the Upper Desert landform promote very high velocity flows. This creates a potential for bank erosion and bed scour.

Due to bedrock outcrops and relatively large diameter sediment particles found in these washes, bed scour may be arrested by channel armoring, particularly in association with road crossings. This phenomenon will be evaluated on a case-by-case basis.

Avoid the use of structures that might form an artificial grade control to the maximum extent possible. Consider clear span bridges for crossings where multiple barrel culverts impede flow due to the amount of sediment transport or debris that is likely during major storm events.

Include the entire top-of-bank to top-of- bank dimension that exists naturally in addition to the area normally required to contain the 110-year storm water flows within drainage easements along such washes.

B. Over-bank Flow and Braided Washes

In portions of the Upper Desert landform and across most of the Lower Desert landform the washes do not have natural channels that provide adequate capacity to contain major storm flows. In major storms flows will flow out of the visible channel and inundate adjacent lands, divert into other braided channel courses and/or become sheet flows not defined to any particular drainage way.

In order to protect structures and public infrastructure, modifications to or the restructuring of the natural drainage ways may be needed. The preferred approach to maintaining control of flood flows along such drainage ways is to provide reinforced channel banks through the use of reinforced embankments, flood walls, raised pads for buildings or other such methods.

The reconstruction or relocation of a natural channel will only be considered when there is no other reasonable approach available. Any modification of washes that have a 100-year flow of 50 cfs or greater will require a modification approved by the Zoning Administrator as proscribed in ESLO (see www.scottsdaleaz.gov/codes/ESLO).

C. Residential Development

1. Design residential street systems to avoid the diversion or blockage of the historical drainage patterns.
2. Contour and align streets so that the water they do collect is directed into the historical drainage course on the site.
3. During the construction phase of residential development, take precautions to minimize erosion that will tend to occur on disturbed ground surfaces (utility alignments, street cuts, etc.).
4. Disperse on-site flows off of improved portions of residential properties to minimize off-site erosion or should be directed into a defined drainage course in a manner that minimizes erosion and does not alter the flow characteristics of the drainage way.

D. Utility Installations

1. Complete the installation of underground utilities in a manner that will not create conditions that could lead to the alteration of historical drainage patterns.
2. Keep utility crossings of drainage ways to the minimum extent feasible.

3. Wherever possible place utility crossings in conjunction with road crossings and diagonal to the flow path of the drainage way.
4. Place utility crossings in natural or manmade channels below the maximum expected scour depth of such channels, in addition to the usual depth of cover.
5. Do not place utility corridors alongside drainage ways within the area that could be inundated in a 100-year storm flow or through the native riparian vegetation along the drainage way.

E. Culverts and Grade Crossings

1. Account for potential clogging due to sediment and debris in the design of culvert capacities.
2. Construct headwalls and wingwalls at culvert entrances. In addition an erosion resistant apron may also be necessary when analysis indicates the need. The Federal Highway Administration has several useful manuals that address the design of such facilities.
3. Consider the possibility of flow over the roadway in the design of culverted roadway crossings and provide erosion resistant bank protection on both the upstream and downstream side-slopes as needed.
4. Where "wet" crossings of washes are approved (by the Planning and Development and Community Facilities General Managers, or their designees) a concrete road surface may be necessary for that portion of the street which will be inundated during a 25-year storm. Concrete cutoff walls shall be designed and constructed on both the upstream and downstream sides of the roadway. All "wet" crossings shall be posted.

ROADWAYS 2-2.300

This section focuses on the establishment of minimum design guidelines for roadway improvements within the ESL areas.

Alternative design solutions shall be considered if appropriate technical analysis and documentation can demonstrate compatibility with the environmental management objectives for ESL areas.

Roadways can impact environmentally sensitive lands not only during construction, but also over the life of their use. Obstruction of natural drainage channels, introduction of road surface pollutants and disruption of habitat conditions are a few of the effects that need to be carefully considered during the planning stages of any project proposal. This section provides guidance in ways to effectively mitigate some of these impacts.

Some of the goals to meet in the design and construction of roads in the ESL area are:

1. No slope movement or surface subsidence from construction shall occur outside of the approved construction limits for the road project.
2. Do not obstruct the capacity and function of drainage channels by roadways.
3. Do not create artificial sub-basins with road construction and layouts unless specifically approved as a part of a subdivision plat.
4. Do not impact water quality through the introduction of surface run-off pollutants from road surfaces.
5. Do not obstruct connections between significant riparian habitats or vista corridors with the roadway layout.
6. Replace native vegetation removed for roadway construction to the greatest extent possible.

2-2.301 GENERAL DESIGN FACTORS

In ESL areas, the location of a roadway both horizontally and vertically as well as its cross-section, should be compatible with the surrounding environment. To achieve this the following factors should be considered. Design specifications for roadways in the ESL areas are listed in Section 5-3 and Appendix 5-3B.

A. Location

Locate the roadway in such a way that the impacts to the natural environment are minimized (see Figure 2.2-2).

B. Alignment and Profile

Follow the topography of the area with the roadway design to minimize excavation and embankment scars. Curvilinear horizontal alignments and gently rolling profiles consistent with the natural topography minimizes unnecessary disturbance to the existing environment.

C. Natural Features

Avoid significant natural features, such as stands of vegetation and rock outcroppings, when suitable alternative alignments are available.

D. Structures

Consider impacts on vegetation, topography, wildlife movements and the viewshed in the design and location of roadway structures.

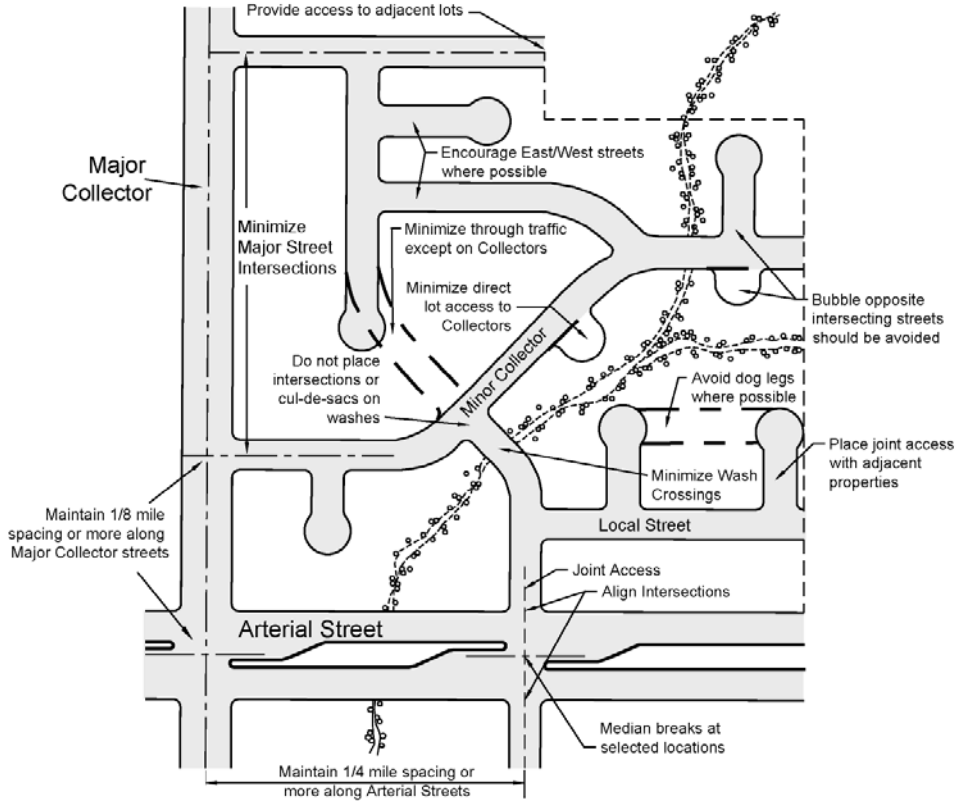


FIGURE 2.2-2. SUBDIVISION STREET PLANNING

SPECIAL CONSIDERATIONS FOR ROAD CROSS-SECTIONS 2-2.302

A. Street Right-of-Way

Additional rights-of-way may be required for cut or fill slopes, bike paths, horse trails, traffic control devices, fire hydrants or other public facilities that are located adjacent to streets. Where cut or fill slopes extend beyond the rights-of-way, a permanent easement may be provided in lieu of increasing the width of the rights-of-way.

B. Shoulders

All roads within ESL areas should have improved shoulders. Construct shoulders with clean native topsoil that is free from roots, debris, heavy clay, and large stones or rocks. Compact all shoulders to a minimum of 90 percent of maximum density.

C. Cross Slopes

In ESL areas it may be necessary to use roadway cross slopes to control drainage. The slope of shoulders should match the pavement cross slope.

D. Utility Locations

In general, place utilities within the improved area of the pavements and adjacent shoulders. If it is necessary to place utilities outside the bounds in a Public Utility Easement (PUE) of the road improvements, give special attention to minimize the amount of grading, loss of native desert vegetation and impacts to the natural drainage character of the natural desert land.

ROAD GRADING 2-2.303

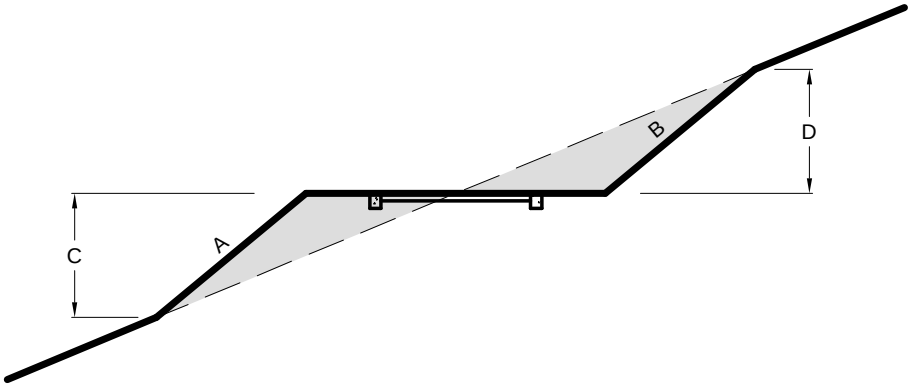
The purpose of this section is to establish criteria for cut and fill slopes, slope stabilization, erosion controls and restoration of scarred areas due to roadway grading. All roadway improvement plans and street design must be done under the supervision of a registered Civil Engineer.

A. Side Slopes

1. Consider stability, maintenance and appearance of cut and fill slopes during construction. Use geotechnical reports for safe slope gradients.
2. The maximum slope gradient for fill slopes adjacent to and at least 10 feet from the curb of roadways is 4:1 (horizontal to vertical) and for cut slopes is 3:1, unless otherwise approved by the Planning and Development Services and Transportation General managers or their designees.
3. In areas where the engineer anticipates unstable soils or potential erosion, flatter slopes or specific mitigation techniques may be accepted. Design measures to mitigate unstable slope conditions and potential erosion problems must be identified within the geotechnical report.
4. Steeper slopes are allowable provided the geotechnical conditions are properly analyzed and a stable embankment is detailed on the construction plans. Fill slopes steeper slopes than 4:1 require the use of guardrails.
5. The maximum height of a cuts and fills for roadway improvements is 8 feet in the Upper and Lower Desert Landforms and 12 feet in the Hillside Landform as measured vertically from the pavement surface to the natural grade at the toe or top of the constructed slope (see Figure 2.2-3). When retaining walls are used, the exposed height should be the height of the retaining wall plus the vertical height of the retaining slope. In addition, these maximum heights will limit length.

Slope Height	Maximum Length
0-4 ft	None
6 ft	375 ft
8 ft	300 ft
10 ft	225 ft
12 ft	150 ft

6. Maintain an average height of 6 feet in the Upper and Lower Desert Landform and 8 feet in the Hillside Landform areas for any continuous slope. Determine the average slope height by using individual slope heights measured at 50-foot intervals.
7. When there is a combination of cut and fill slopes at any one station along the roadway, do not exceed a combined slope height of 12 feet in Upper and Lower Desert areas and 16 feet in Hillside areas.



A: 4:1 SLOPE (3:1 WITH GUARD RAILS)
B: 2:1 SLOPE
C: 12' MAX. / 8' AVERAGE FOR EACH 50' LENGTH
D: 12' MAX. / 8' AVERAGE FOR EACH 50' LENGTH
C+D: 16' MAX.

FIGURE 2.2-3. HILLSIDE LANDFORM ROAD CUTS

8. Heights exceeding the above criteria may be allowed by the Development Review Board or Zoning Administrator provided it can be demonstrated that the objectives of ESLO are not compromised.
9. Round all slopes to blend into the existing terrain to produce a contoured transition from the slope face to the natural ground.
10. Planning Development Services staff may require mitigation techniques for cuts and fills greater than 8 feet to be presented to the Development Review Board for approval. Slopes and fills must be engineered in accordance with the recommendations of the geotechnical report.

B. Retaining Walls

Retaining walls may be used to reduce the horizontal and vertical distances required to construct cut and fill slopes.

1. All retaining walls, regardless of height, shall comply with the city building code and also conform to the following requirements. The heights and types of retaining walls may require the approval of the Development Review Board as determined by the Planning and Development Services General Manager or designee based upon the visibility and magnitude of the proposed structure.

2. Acceptable types of retaining walls include stone gravity, structural masonry and reinforced concrete. Do not use other types such as metal cribbing walls and rock gabion walls unless approved by the city.
3. Consider terraced walls in lieu of one wall for instances requiring retaining walls in excess of 6 feet. The minimum dimension of the landscaped level located between the lower and upper terrace walls shall be at least equal to the visible height of the lower wall, but in no case shall be less than 4 feet.
4. In general, match the finish material and color of retaining walls with the surrounding natural stone, rock, or soil color.
5. Retaining walls greater in height than 3 feet will be required to be signed and sealed by a registered Civil Engineer in the State of Arizona.

C. Drainage Controls

1. Design all drainage facilities to carry surface waters to their historical outfall.
2. Do not pond water above cut or fill slopes.
3. Construct and maintain erosion controls (temporary or permanent) to prevent erosion of all slopes and graded areas.
4. Provide surface drainage interceptors at the top of cut and fill slopes where surface runoff will create erosion problems.
5. Sub-surface drainage facilities may be required for stability and protection of affected areas due to ground water seepage.

D. Slope Restoration

Restore and stabilize all exposed slopes created by grading within 90 calendar days after rough grading of the roadway. Restoration shall consist of revegetation with native species of a type and mix consistent with local natural conditions and/or artificial weathering of rock faces. Where applicable, incorporate re-vegetation techniques within the slope design that use native species commensurate with the surrounding environment. A revegetation plan including plant species, locations, sizes and methods of transplanting must be submitted for review and approval.

STREET INTERSECTIONS 2-2.304

Do not place street intersections within the alignment and floodplain of major or minor washes, on or within boulder clusters or other such sensitive environmental features.

STREET LIGHTING 2-2.305

Do not use street lighting within the Hillside landform.

A. In the Upper Desert Landform

Where the average residential density is less than 1.5 dwellings per acre, or the surrounding land use is some form of open space, use street lighting only at intersections with major and minor collector streets. Where the residential density is higher or there are non-residential uses, provide street lighting at all intersections. Finish street lighting equipment to match the surrounding environment (See Section 2-1.802).

B. In the Lower Desert Landform

Where the average residential density is less than 1.5 dwellings per acre, or the surrounding land use is some form of open space, use street lighting only at intersections with collector or larger streets. In all other areas use street lighting based upon the latest

IES recommended standards that are based upon the land use and context of the street (See Section 2.1.802).

2-2.306 SIDEWALKS

A. In the Hillside Landform

Sidewalks shall not be required within the Hillside Landform.

B. In the Upper Desert Landform

1. Sidewalks shall not be required where the residential density is less than 1.5 dwellings per acre or the adjacent land use is an open space area of at least 40 acres, except along arterial or larger streets.
2. Sidewalks shall be required in all other areas.
3. Sidewalks may be allowed on one side only of a street by the Planning and Development Services General Manager or designee if the street is accessed only on one side, the street is a cul-de-sac of less than 400 feet in length, or the local land slopes generally average 10% or more.

C. In the Lower Desert Landform

In areas where the average residential density is less than 1.5 dwellings per acre sidewalks shall only be required along major collector or larger streets. Sidewalks shall be required in all other locations.

D. Other Considerations

Shoulders may be used as pedestrian ways provided safety is not compromised. In these cases, wider shoulders may be used in place of a concrete sidewalk.

2-2.307 BIKEWAYS

Scottsdale policy requires bikeways on all arterial and major collector roads (see Section 5.7 Bikeways). However, this requirement is waived in the Hillside landform.

2-2.308 DRIVEWAYS

A. Residential Developments

In general, limit driveways in ESL areas to one per residence. However, additional and circular driveways will be permitted provided they do not adversely disrupt the surrounding natural desert environment.

1. The minimum driveway width for driveways less than 200 feet long is:
   - 16 feet in the Upper and Lower Desert Landforms, and
   - 12 feet for driveways in the Hillside Landform.
2. The maximum linear grade of a driveway shall be 18% and the average grade for the length of the driveway shall be 12%.
3. In order to minimize crossings of drainage ways, shorten the length of cul-de-sacs in steeper terrain and protect boulder clusters or formations, a single driveway may serve more than one residence but not more than four residences provided that:
   a. The maximum length is 400 feet, unless specifically approved by the Planning and Development Services General Manager or designee,
   b. The minimum width is 24 feet in the Upper and Lower Desert Landform, and
   c. The minimum width is 18 feet in the Hillside Landform.

4. Driveways greater in length than 150 feet or with grades steeper than 12% in Hillside areas must receive prior approval by the Planning General Manager, or designee as well as from the city's Fire Department. Design such driveways based upon the following criteria and Figure 2.2-4 (also refer to the Fire Code adopted by the city of Scottsdale, www.scottsdaleaz.gov/codes):

   a. Where the driveway gradient is 0 to 12%:
      - The driveway surface shall be all-weather,
      - The minimum driveway width shall be 16 feet if it is longer than 200 feet, and
      - A turn-around is required if the driveway length exceeds 200 feet.

   b. Where the driveway gradient is from 12.1 to 15%:
      - The driveway shall have a hard surface,
      - A turn-around is required if the driveway length exceeds 200 feet,
      - The minimum width shall be 16 (2 feet wide compacted shoulders on each side may be used) feet if it is longer than 200 feet, and
      - A "4-head" sprinkler system is required where the hose lay exceeds 200 feet.

   c. Where the driveway gradient is from 15.1 to 18%:
      - The driveway shall have a hard surface,
      - A turn-around is required if the length of the driveway exceeds 200 feet,
      - The minimum width shall be 16 (two feet wide compacted shoulders on each side may be used) feet if it is longer than 200 feet, and
      - A "4-head" sprinkler system will be required.

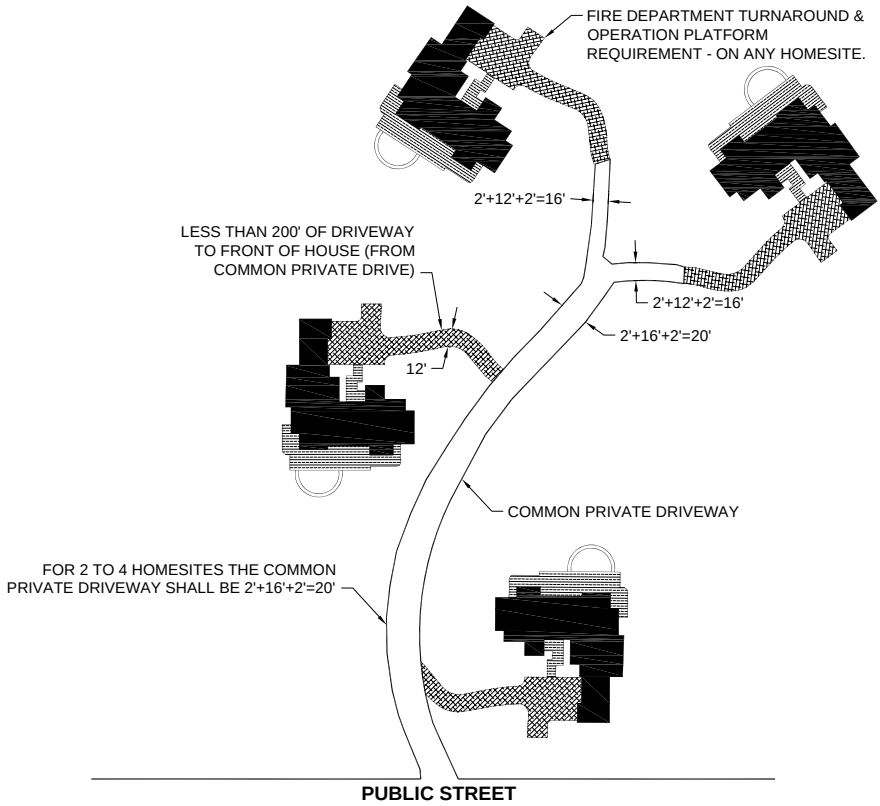


FIGURE 2.2-4. PRIVATE DRIVEWAY DESIGN FOR EMERGENCY ACCESS

5. Design driveways and parking areas for adequate vehicle maneuvering and turn around for a Single Unit Truck (SU) as defined by AASHTO.
6. Provide a fire Operational Platform adjacent to the main building whenever the driveway exceeds 12% in grade or is longer than 200 feet. The minimum dimensions for this platform are 20 by 30 feet and the maximum cross slope is 5%. See Figure 2.2-5.

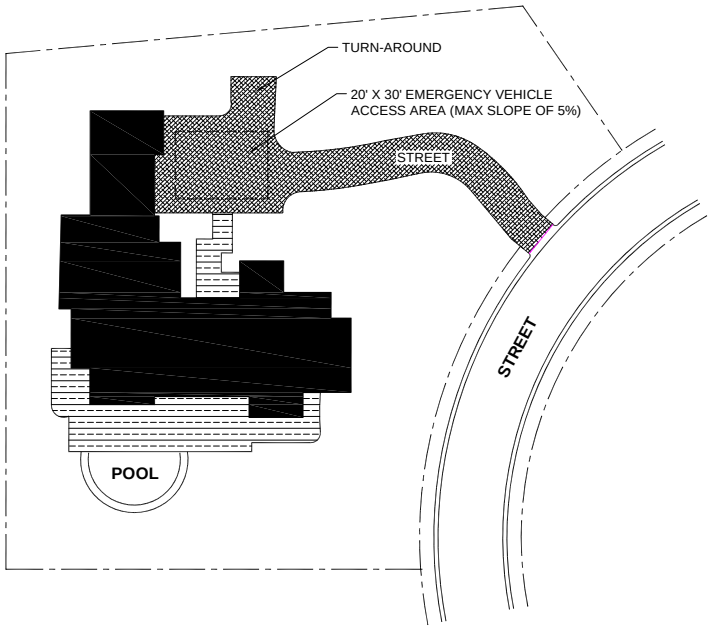


FIGURE 2.2-5. OPERATIONAL PLATFORM FOR FIRE ACCESS

7. Where required, the turn-around shall be either a circular drive with a minimum radius of 40'6" or a T-type hammer head with 16 feet by 76 feet dimensions (see Figure 2.1-2).
8. A turn-out is required along extended driveways at 300 feet intervals. The turn-out shall be at least 20 feet wide for a distance of at least 45 feet, see Figure 2.2-6.

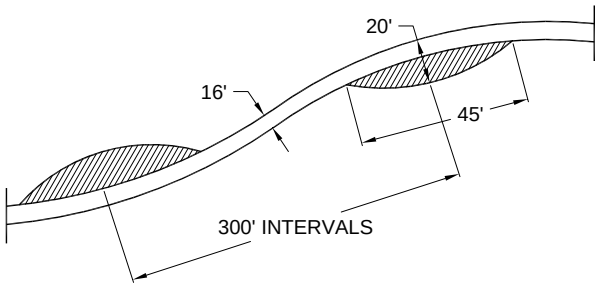


FIGURE 2.2-6. FIRE TURN-OUT FOR EXTENDED DRIVEWAYS

B. Locations

Locate driveways in the Hillside Landform a minimum of 100 feet away from the rights-of-way line of an intersecting street and a minimum of 25 feet from a side property line. The Planning & Development Services General Manager, or designee may make exceptions to this standard in special cases. See Figure 2.2-7.

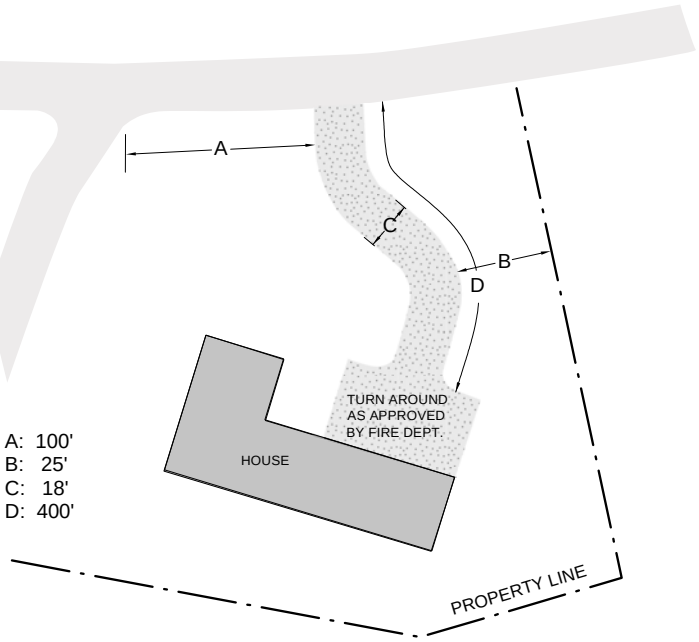


FIGURE 2.2-7. DRIVEWAYS ON HILLSIDE LANDFORM

C. Surfacing

Pave driveway aprons with asphalt, Portland Cement concrete, or concrete pavers. Other types of stabilized surfaces, such as cemented native granite or approved equal, may be allowed where it can be demonstrated that there would be no erosion off of the surface and the construction will allow for the loading of emergency vehicles. Where sidewalks are used, design and build the driveway apron according to MAG standards.

SITE WORK 2-2.400

The intent of these guidelines is to promote creative design and innovative methods for site development within the ESL overlay area. Modified grading guidelines may be allowed where it can be demonstrated that they achieve the goals and purposes of ESLO. Grading includes initial clearing, grubbing, excavating and placement of fill associated with any form of development.

This section establishes guidelines for grading which are intended to:

- Regulate the development of potentially hazardous terrain;
- Preserve the general visual character of graded sites; and
- Preserve native vegetation and wildlife habitat.

Consider the following key elements during the design and implementation of all grading activities.

1. Conserve the natural environmental features and functions of the site;
2. Design and construct grading to be compatible with the surrounding natural desert land;
3. Use construction techniques that result in no slope movement or subsidence and the stabilization of hillsides, slopes or other areas subject to erosion or mass movement,

4. Preserve the natural capacity of drainage courses and protect natural drainage ways, including the native vegetation associated with them;
5. Control dust pollution and surface water runoff and related erosion during construction operations.
6. Maintain the stability of underlying geological conditions wherever development is proposed, unless specific mitigation measures are proposed to assure safe development of the land.
7. Do not alter drainage basin boundaries.
8. Do not create any obstructions within any drainage channels.
9. Do not increase the movement of sediment in volume or velocity as a result of any modifications to natural channels.
10. Do not obstruct scenic, riparian, or vista corridors and preserve or restore them to a natural desert condition.
11. Minimize the removal of topsoil and vegetation kept to the least necessary to allow for the approved development.
12. Design and finish graded cuts and fills that are visible from adjacent properties in a manner that matches the surrounding native soils and rocks.
13. Leave significant natural boulders and rock formations intact and do not damage them to the greatest extent possible.

2-2.401 APPLICABLE PROJECTS

A grading permit is required of all development projects, private or public, for ESL areas, except as exempted herein. Categories for general grading that require a grading permit include but are not limited to the following:

1. Residential development for a single lot of any size.
2. Residential or mixed-use development that requires a subdivision plat or development plan.
3. All other nonresidential types of development.
4. The clearing, brushing or grubbing of any area where grading for any purpose is to be done.
5. Temporary off-site stockpiling of fill material.
6. Driveways and parking areas where the graded area will be greater than five hundred square feet.
7. Recreational facilities such as golf courses, parks and ball fields.
8. Educational institutions and schools (public or private).
9. Public service facilities such as fire stations, police stations and libraries.
10. Public infrastructure facilities such as water storage tanks, flood control structures and wastewater treatment facilities.

2-2.402 EXEMPTIONS

The following activities are not required to have a grading permit:

1. Resurfacing or maintenance of an existing paved surface.
2. New graded area less than five hundred square feet.

3. Excavation below finished grade when the excavation is for the construction of a basement, foundation, wall or swimming pool if authorized by a building or zoning construction permit.
4. Exploratory excavation performed under the direction of a registered soil engineer or geologist, provided all excavation is properly backfilled.
5. Archaeological exploration of an archaeological site recognized by the State.
6. Removal of native vegetation when being performed under an existing de-vegetation permit.
7. Underground utility installations under a graded or paved roadway surface.
8. Grading for maintenance purposes of an existing private road, access or driveway, provided that it existed prior to the adoption of ESLO or that it was established in conformance with this section.
9. Land uses which are exempt under statutory regulations.

GEOTECHNICAL INVESTIGATIONS 2-2.403

Most grading activities in ESL areas require some level of geotechnical investigation and analysis, the level of which shall be left to the discretion of the city and the engineer based upon the known conditions on the site. Such studies are required where there are known or likely occurrences of unstable slopes, exposed or shallow bedrock, onsite materials that may bear radon elements, soils with high shrink/swell potential or the presence of caliche hardpan. Exceptions to this requirement may include the construction at single-family residences where the improvements are not occupied structures or are not attached to any rock materials.

MAXIMUM GRADING AREA 2-2.404

1. Grading is allowed to occur only within an approved construction envelope.
2. The maximum grading area for any parcel is based on Natural Area Open Space (NAOS) requirements. Grading is not permitted within designated NAOS areas. When utility trenches cannot be reasonably provided without crossing designated natural or open space areas, such trenching activities may be allowed provided all disturbed areas are revegetated to a natural condition.
3. The actual graded area for any parcel must be less than or equal to the developable area of a parcel as specified in ESLO. If a conflict arises, the terms and conditions of the Ordinance shall govern.
4. Site grading that impacts special features is prohibited; these areas are identified on ESLO Special Features Map or the High Priority NAOS Locations map (see www.scottsdaleaz.gov/codes/ESLO/). Plan site work to avoid cutting off significant riparian and habitat corridors and buffer areas should be provided around developed sites. The design of final grading must consider view shed impacts.
5. Grading is prohibited where geologic hazards are identified, unless a specific exemption to this guideline has been approved by the Planning and Development Services General Manager, or designee, as the result of the recommendation of the geotechnical investigation. Such areas may include but not be limited to boulder rolling, rockfalls, slope collapse and talus slopes.

Modifications to these grading limits may be approved by the Planning & Development Services General Manager, or designee, if warranted due to special conditions such as unique soil or geologic conditions.

2-2.405 GRADING DESIGN GUIDELINES

A. Cut and Fill Slopes

1. Maximum Slope Gradient

a. Use geotechnical reports to provide recommendations for safe slope gradients for exposed cuts or fill materials. Unstable slope conditions and potential erosion problems must also be identified within the geotechnical report as well as adequate design measures to mitigate these conditions.

b. Typically, safe slope gradients in ESL areas range between 4:1 to 2:1 (horizontal: vertical). For exposed cut slopes the structural nature and strike and dip of the native soil or rock material being cut into governs the appropriate slope gradient. For exposed fill slopes the appropriate slope is based on the natural angle of repose based upon the structure of the fill material.

c. Where applicable, incorporate re-vegetation techniques within the slope design. In general, the steepest slope for revegetation or landscaping is 3:1.

d. Conform slopes adjacent to roadways to the requirements in Section 2-2.303.

2. Heights

a. In general, do not exceed 8 feet for the height of cuts and fills in ESL areas, as measured vertically from the finished grade to the natural grade.

b. Exceptions to this guideline are subject to the approval by a Project Coordination Manager where a cut surface will be entirely hidden by a building.

c. Cut and fill heights greater than 8 feet may be allowed where it can be demonstrated that the objectives of ESLO are not compromised.

d. City staff may require cuts and fills greater than 8 feet to be presented to the Development Review Board for approval.

3. Slope Shaping

a. Round all man-made slopes at the edges to blend into the existing terrain adjacent to this new slope in order to produce a contoured transition from the slope face to the natural ground.

b. Incorporate undulating slopes in all man-made slopes greater than 500 square feet in area to reflect the natural undulations occurring in the adjacent desert.

4. Slope Revegetation

a. Restore all exposed slopes created by grading to a natural condition and stabilize them in order to minimize erosion and slope collapse or wasting.

b. Restoration shall consist of revegetation with native species as found on similar natural slopes in the area.

c. Treat cuts into rock or caliche with artificial weathering techniques.

d. Irrigate all revegetated areas for at least three years or until the vegetation has become established. When the irrigation is no longer needed shut off the system by the use of a manual gate valve.

e. Do not use imported decomposed-granite soil-cover/mulch in revegetated areas or in any place within NAOS areas.

5. Setbacks

Identify setbacks for all buildings and structures from the toe of a cut slope, top of a fill slope, or retaining wall shall be and comply with the city building codes and the engineer's recommendations. Setbacks shall be sufficient to provide stability and prevent damage from erosion. Larger setbacks may be enforced in order to meet the intent of ESLO.

6. Drainage Considerations

a. Construct and maintain erosion controls (temporary or permanent) to prevent erosion of all slopes and graded areas.

b. Design building sites to carry surface waters away from buildings at a minimum grade of 2 percent for a minimum distance of 10 feet from any buildings.

c. Provide surface drainage interceptors at the top of all cut and fill slopes where surface runoff will create erosion problems.

d. Do not pond water above cut or fill slopes.

e. Sub-surface drainage facilities may be required for stability and protection of affected areas due to ground water seepage.

7. Building Height

Care must be taken to insure that all building pads and finish floor elevations are established so that the maximum allowable building height does not exceed the building height outline limit as specified in ESLO.

B. Terraces and Retaining Walls

The use of retaining walls is an effective means to minimize grading, reduce the height of cut or fill slopes, and to stabilize slopes. All retaining walls, regardless of height, shall comply with the city Building Code and also conform to the following requirements. The heights and types of retaining walls may require the approval of the Development Review Board, as determined by a Project Coordination Manager.

1. Terraces

a. Terracing may be employed where deemed necessary by the engineer or where desired in order to reduce the amount of area to be graded.

b. In order to minimize the impacts of the grading on a project, terracing may be required by Planning and Development Services staff.

c. In general, the minimum width of terraces shall be at least 4 feet wide or equal to the height of the lower retaining wall if it is taller than 4 feet, in order to allow for the future maintenance of the retaining wall and allow for landscaping materials that will screen the visibility of the walls.

2. Types of Walls

a. Acceptable types of retaining walls are stone or concrete gravity, structural masonry, and reinforced concrete.

b. Other types such as metal cribbing walls, or rock gabion walls are not permitted unless approved by Planning and Development Services General Manager or designee, or the Development Review Board.

c. The finish material and color of retaining walls should match the surrounding natural desert stone, rock or soil color.

3. Alignments of Walls

Use undulating or angular alignments for all terrace walls greater than 50 feet in length.

4. Heights

a. Do not exceed 6 feet for the exposed height of any single retaining wall in ESL areas, as measured vertically from the inside ground level to the downside ground level.

b. Use terracing wherever the vertical height to be contained by the retaining wall exceeds 6 feet of fill material or 8 feet of cut, see Figure 2.2-8 below.

c. Meet structural stability for overturning, slope sliding and drainage considerations for all walls, regardless of height.

d. The maximum face height of a wall that combines a retaining wall and a solid wall shall be 10 feet (the maximum height of the wall above the retaining wall structure as measured from the retained ground level shall meet the normal zoning wall height standard).

e. The maximum face height of a combination of retaining wall and view fence shall be 12 feet (again, the maximum height of the wall/view fence above the retaining wall shall meet the usual zoning standard).

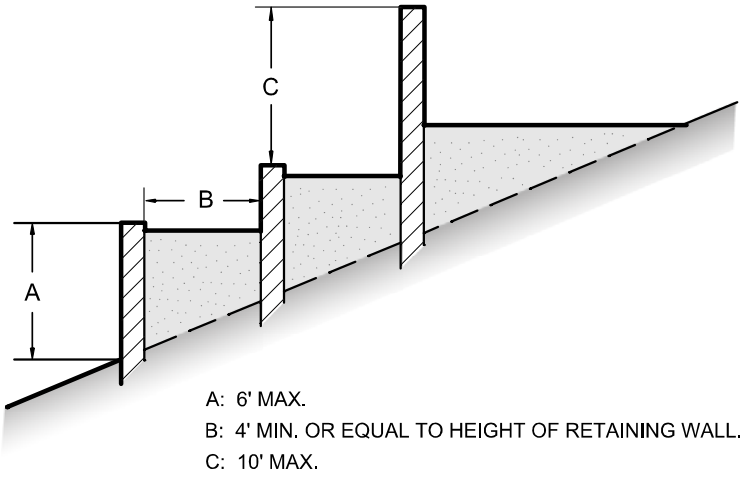


FIGURE 2.2-8. RETAINING WALL DIMENSIONS

C. Site Restoration

1. Required Restoration

Re-establish desert vegetation on all disturbed areas. All revegetation shall be done with native species in a comparable density and pattern to that which exists upon the undisturbed adjacent areas.

2. Slope Protection

On slopes where erosion may be a problem or the slope materials and/or gradient will not readily support soil binding plants, hold the plant material in place by anchored straw mulch, erosion control fabric, or an equivalent material.

3. Plant Materials for Slope Restoration

Where the slope restoration includes the use of revegetation of native desert plants, use those plants that occupy similar natural desert slopes in steepness and orientation in the area. The applicant shall demonstrate in their design submittal how they have studied and achieved this. If non-native landscaping is to be used, use those plant materials that do not require saturated soil moisture and provide good soil binding characteristics.

4. Timing of Slope Restoration

Complete all site restoration for any type of development within 90 days of the completion of work or prior to the issuance of a certificate of occupancy, whichever occurs first.

D. Construction of Fills or Embankments

1. Fill Materials

Comply with the engineer's recommendations for the preparation of areas that are to receive fill material and the fill material itself. At a minimum, fill material should not contain any organic material, building materials, plastics, metals, hazardous wastes or refuse debris. Do not bury or place rocks, pieces of concrete or asphalt pavement, or other irreducible material with a maximum dimension greater than 8 inches in any fill unless their placement has been specified and inspected by the engineer.

Place and compact all fills in accordance with the engineer's specifications.

2. Expansive Soils

The engineer must insure that there will be no adverse impacts created by expansive soils. Should the engineer's investigation reveal the presence of expansive soils, the grading plans are required to include specifications as to how these soils will be handled.

3. Excess Material

Haul excess material to an appropriate off-site disposal area that has been approved by the Planning and Development. The disposal area must be outside of any Hillside landform area. An offsite hauling permit may be required from the city.

4. Dust Control

Apply approved dust control methods during all grading, and until revegetation or site restoration is complete. Prior to the start of grading activities, a dust control program and a permit must be obtained from the Maricopa County Health Department.

SITE DESIGN GUIDELINES 2-2.500

Consider the following key elements in site design for any proposed development for the protection of the unique visual quality and the native desert environment in the ESL area:

1. Preserve view corridors along significant public transportation routes should be;
2. Minimize scarring of the natural topography;
3. Preserve existing vegetation as much as is feasible;
4. Preserve drainage ways as view and wildlife corridors, thus providing open space connections throughout proposed development areas;
5. Protect significant visual features such as peaks, ridgelines, rock outcrops, boulder fields and significant stands of vegetation wherever feasible.

GENERAL DESIGN GUIDELINES 2-2.501

The following guidelines apply to all areas that are visible from public viewpoints or nearby development, which shall be designed and sited to blend into the landscape.

A. Site Development - all buildings, structures, walls, and fences

1. Blend all exterior finish surfaces with the color and texture of the surrounding stone, rock or soil color.
2. Do not use reflective building materials. Recessed window and entry openings and deeper roof overhangs are encouraged.
3. Preserves the ridgeline silhouette of significant topographic features by locating all improvements below the ridgeline and using a finished height that does not protrude into the silhouette as viewed from nearby public roads.

4. Match and blend buildings and surrounding improvements with the form of the landscape. Use stepped floor elevations to avoid massive building forms and wall surfaces that contrast with the surrounding terrain.
5. Use exterior lighting fixtures that are recessed or shielded so that the light source is not visible from a public viewpoint or other development in the immediate area. Direct building mounted lighting downward.
6. Screen all exterior mechanical equipment with material complementary to both the structure and the surrounding environment.

B. Walls and Fences

1. Perimeter Walls

a. In general, perimeter walls are not a preferred approach to providing privacy and minimizing the impacts of nearby roads. Consider using walls around individual building envelopes, mounding that blends into the terrain and other such treatments. Were they are going to be used, do not place perimeter walls within 25 feet of a perimeter street rights-of-way or a property line.

b. Use undulating, notched, or similar non-linear alignments for perimeter walls. They should move around significant natural desert vegetation, leaving substantial room fro these plants to survive (3 feet out from the canopy of desert trees and at least half the height of saguaros).

c. Use designs and materials for perimeter walls that reflect the form, materials, texture and colors of the natural desert setting.

d. Do not include the area within 5 feet on either side of a perimeter wall within a NAOS area.

e. Maintain continuity of Natural Area Open Space; do not separate adjacent NAOS areas with perimeter walls.

f. Do not cross minor or major watercourses with perimeter walls.

g. Install openings in perimeter walls at least 3 feet in width and height at intervals no greater than 200 feet.

2. Individual On-Site Walls

a. Wherever possible on lots of 30,000 or more square feet on-site, set back walls at least 15 feet from the property line.

b. Where on-site walls are placed adjacent to NAOS areas at least 50% of the wall surface shall be open.

c. Do not cross or enclose minor or major watercourses with on-site walls.

3. Fences

Fences may cross drainage ways as long as they do not impede storm flows, collect debris in storm flows or block the passage of wildlife.

4. Walls Along Vista Corridors

a. Walls located immediately adjacent to a Vista Corridor easement are limited to a height of 3 feet. Set back taller walls parallel to Vista Corridor easements an additional 4 feet for each foot of wall height above 3 feet.

b. Place walls along the edge of Vista Corridor easements at least 2 feet back of the grade break at the top of the natural channel of the wash, as long as the channel capacity is sufficient to contain the 100-year storm flow.

C. Ancillary Improvements

1. Corral Areas

Do not place corral areas over or across minor or major watercourses, boulder clusters or rock formations. Also, do not place them on areas with slopes in excess of 15%.

2. Tennis Courts

Do not build tennis courts on terrain with slopes in excess of 15%. On slopes of 3% or more cut tennis courts into the slope rather than placing them upon fill material. The screen fencing should be a dark color, preferably black or dark brown.

3. Parking Areas

On slopes of 5% or more divide parking areas into sections generally with no more than 50 spaces. Use landscaped islands to transition the grade breaks across parking areas. Direct run-off from parking areas into detention basins, unless there is no reasonable opportunity to do so. The maximum height of light poles in parking areas is 16 feet in the Upper Desert Landform and 14 feet in the Hillside landform.

D. Other Site Design Considerations

1. Outdoor Lighting

The maximum mounting heights for outdoor building, parking lot, landscaping and security lights is 16 feet in the Upper Desert and Hillside landforms.

2. Firebreaks

Maintain firebreaks within 30 feet of any occupied structure. A firebreak shall consist of a maintained area where the typical herbaceous and grass plant materials that grow annually are kept clear. This does not include the removal of any perennial plant materials, except those that might overhang structures. In lieu of the removal of certain plants, fire-rated walls and/or exterior fire sprinklers may be considered. Cantilevered, bridged or similar types of structures may be allowed subject to the approval of the city's fire service provider.

3. NAOS Setbacks

NAOS easement may be located adjacent to site walls, driveways, parking area or similar construction as long as the first five feet of NAOS out from the improvement is revegetated, as provided in the ordinance. Adjacent to any roofed structure, the NAOS easement shall be placed at least 5 feet away from the structure, with the next five feet out from the structure being revegetated area, see Figure 2.2-9.

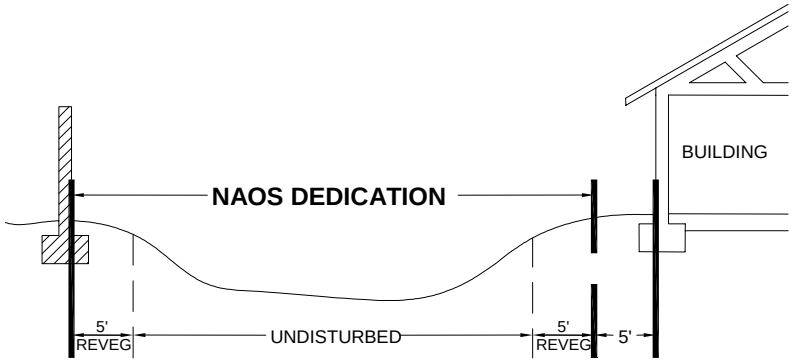


FIGURE 2.2-9. NAOS LOCATION GUIDE

4. Landscaping

a. The palette of plants that can be used for areas that are not enclosed or trees that exceed a mature height of 20 feet are listed on the city's Indigenous Plants for Environmentally Sensitive Lands publication. The use of any other plant materials in such situations shall be subject to the specific approval of the Zoning Administrator or designee. Refer to www.scottsdaleaz.gov/codes/nativeplant/.

b. Used hydro-seed applications in revegetated areas only as a supplement to the use of container or relocated plant specimens. The seed mix in terms of plant types and ratios shall be based upon the native mix and density that occurs on the site.

c. Design and install swimming poll filtration systems in such a manner that no flows shall enter any NAOS areas or drainage ways.

d. No landscape lighting is allowed within NAOS areas.